

CHATSWOOD TRANSPORT INTERCHANGE

LAING O'ROURKE
CHATSWOOD NSW





Project | Chatswood Transport Interchange
 Location | Chatswood, NSW
 Project Value | \$160 Million
 Project with Towers Value | \$360 Million
 Gross Lettable Retail Area | 10,000m²
 Concrete Quantity | 29,500m³
 Reinforcing Steel | 3000 T
 Architects | COXDesignInc (JV – Cox Richardson & Design Inc)
 Structural Engineers | Taylor Thomson Whitting
 Design & Construct | Laing O'Rourke
 Public Private Partnership | Transport Infrastructure Development Corporation and CRI Australia Pty Ltd

FULL STEAM AHEAD

Laing O'Rourke is a global construction and development company. It is also one of the leading privately owned construction companies in the world. The acquisition of Barclay Mowlem in 2006 has provided a fresh influx of local Australian knowledge, expertise and insight to a company that takes great care to ensure ideas and information flow freely between its international divisions.

With 27,000 employees located across the globe in Europe, the Middle East, India, Asia and Australia; Laing O'Rourke is well positioned to deliver some of the worlds most innovative, forward thinking and dynamic projects. The global leverage the company possesses adds essential know-how and intimate local knowledge to all of their projects wherever they may be undertaken. The Chatswood Transport Interchange (CTI) Project benefited significantly from

this aspect of Laing O'Rourke's operations. Considerable effort, communication and cooperation have been devoted to understanding the specific requirements of the locale and the project. This includes regular consultation with stakeholders, local businesses and residents to ensure that all are well informed about the project and its progress. The dissemination of information regarding the project has been both extensive and accessible in the form of electronic and printed media and via the 1800 project phone line. With an infrastructure undertaking of this size it is sometimes easy to overlook the need for the general public and stakeholders to share ownership through a clear understanding. It is not a coincidence that the project has progressed smoothly without undue or inaccurate publicity.

The scope of the CTI and its expected benefits

for the transport hub of Chatswood and the North Shore is anticipated to be significant. Designed to interface with the existing North Shore Rail Line and the new Epping to Chatswood Rail Line, the CTI project consists of the construction of redesigned pedestrian and rail concourses including lift and escalator access to rail platforms and bus interchange, rail bridges over Help Street and Albert Avenue. Also the widening of both Help Street and Albert Avenue from four to six lanes and two to four lanes respectively, including road-lowering of Help Street to increase bridge elevation, and the relocation of the existing bus interchange to incorporate the addition of taxi ranks and kiss-and-ride spaces. The CTI has been designed to accommodate 760 bus movements per day and the through traffic of an anticipated 100,000 commuters and pedestrians daily. Further consideration has been made for commuter convenience and

retail outlets in keeping with today's eat and shop-on-the-run lifestyle. Future plans include the development of three landmark residential towers to accommodate 509 units with secure underground parking.

Laing O'Rourke brought significant insight and expertise to the CTI project, having undertaken a number of large infrastructure projects elsewhere around the world. The company's ability to provide innovative tailored solutions to the challenges presented was demonstrated by their use of a 'floating track slab design'. This consists of separate floating slabs supported on and isolated from the CTI structure by rubber load bearing pads. As a result, train generated noise and vibration is considerably reduced. This type of design is a first for Australia.

Other initiatives on the project included the creation of rainwater retention tanks to provide non-potable water for the project,

AAA rated taps and waterless urinals and the recycling of excavated concrete waste, paper and cardboard.

The true value of any company and a significant factor in the overall success of the project is its employees and associated project contractors. Laing O'Rourke take worksite safety extremely seriously and with approximately 5000 personnel involved with the CTI Project and close to 1 million man hours worked, the task of ensuring a safe and healthy work environment was substantial. Ongoing training and development was provided throughout the project for the entire CTI workforce including 'tool box' meetings, guest OH&S safety speakers, who presented OH&S updates and information, and the introduction of compulsory eyewear for the project. So successful was the introduction of compulsory eyewear in reducing the number of injuries that the policy has now been adopted nationwide by Laing O'Rourke.

Laing O'Rourke has an international reputation for innovative development and dynamic construction. With 27,000 employees world wide and global operations creating a turnover in excess of A\$8.7 billion, their expertise and experience is unmatched by any other privately owned company. The delivery of the CTI Project will not only create an enhanced transport and business hub for North Sydney but it is sure to add to a prestigious stable of highly regarded projects and further enhance Laing O'Rourke's already strong reputation.

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FROM THE GROUND UP

JA Bradshaw Civil Contracting is a name that has become synonymous within the civil contracting and excavation industry. The company has accumulated a wealth of experience and an in depth understanding of the intricacies of project management and successful completion. Both the owner/directors, Kevin Couter and Gary Dowling, bring real hands-on knowledge to the delivery of their services, both having being involved in the different facets of the industry for many decades.

JA Bradshaw Civil Contracting was engaged by Lang O'Rourke to undertake earthworks and shoring for the Chatswood Interchange project. Close liaison, a trademark of JA Bradshaw's Civil Contracting operations, provided effective and efficient delivery of their services, within time and budget requirements.

The company's dedication to honest, reliable and competent work is one of the core principles of JA Bradshaw Civil Contracting – another is their dedication to their employees. Providing safe, productive, and interesting

employment has seen many of their employees remain with the company since the 1970's. This longevity has guaranteed the commitment to quality extends right through the company structure to become a defining aspect of their operations and an aspect that has ensured the satisfaction of their clients. Naturally flowing from this paradigm is a strong commitment to OH&S procedures and training.

As Director Kevin Couter puts it, "Our commitment as a company is to ensure great service and to deliver quality projects on time, every time. Clients value our problem solving abilities and our willingness to listen to them and liaise closely throughout the project."

JA Bradshaw Civil Contracting has worked successfully with many of Australia's 'blue chip' developers and building companies on projects such as the Westfield shopping centre extension Tuggerah NSW, Stages 1 – 5 Woolooware Shores Retirement Village -Taren Point NSW and the Silkwood Development - Surry Hills NSW.

Undertaking a broad range of services within the industry from bulk earthworks and civil construction to site remediation and foundation works, JA Bradshaw Civil Contracting specialise in bulk excavation, demolition and bonded asbestos removal, construction of shoring and retention systems, storm water drainage and culvert construction, retaining walls, road works, pavement construction and hard and soft landscaping.

The diversity of JA Bradshaw Civil Contracting, and their industry experience and professionalism are clearly evident in the successful completion of their operations on the Chatswood Transport Interchange.

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SHOWING GOOD FORM

The Chatswood Transport Interchange (CTI) Project and its expected impact on the transport hub of Chatswood and the North Shore will be significant. The interchange is designed to combine with the existing North Shore Rail Line and the new Epping to Chatswood Rail. The works included the redesign of pedestrian and rail access and concourses – lift and escalator access to rail platforms and bus interchange and new rail bridges over Help Street and Albert Avenue. The existing bus interchange has been relocated to incorporate the addition of taxi ranks and kiss-and-ride spaces.

The design of the new CTI will allow for 760 bus movements per day and an anticipated 100,000 commuters daily. Future plans include the development of three landmark residential towers to accommodate 509 units with secure underground parking.

Established in March 2000, The Rix Group was engaged by the developers on the \$160 million CTI project to provide 120 metres of concrete track slab, and to assist in the form-working and creation of four new bridges. Two were cast in situ construction and two were constructed using girders which required extensive suspended formwork. The company also provided shot-crete application services in a number of 'between pile' areas as required.

The CTI Project was an ideal opportunity for The Rix Group to demonstrate their ability to undertake large-scale projects with the same skill, commitment and safety values that they incorporate into their other operations. Specialising in form-working, civil works, and shot-crete application, The Rix Group has expanded rapidly since the company's inception and they now provide their services to a wide range of companies and governmental utilities.

Recently The Rix Group has been assisting Sydney Water in the construction of water storage tanks.

The Rix Group's two year involvement with the CTI project has ensured that the company's attachment to the project and their work was more than just business as usual, and their commitment to the successful completion of their area of operations has clearly been a major highlight. Quite naturally the company is also proud to have had the opportunity to work with Laing O'Rourke and the other parties involved.

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BRINGING IT ALL TOGETHER

The Chatswood Transport Interchange (CTI) Project in Sydney is a sizeable undertaking. The project headed by Laing O'Rourke, required considerable cooperation and coordination between contractors and on site staff.

The scope of the CTI is extensive. Designed to interface with the existing North Shore Rail Line and the new Epping to Chatswood Rail, the project consists of the construction of redesigned pedestrian and rail concourses including lift and escalator access to rail platforms and bus interchange, rail bridges over Help Street and Albert Avenue, the widening of both Help Street and Albert Avenue from four to six lanes and two to four lanes respectively including road-lowering of Help Street to increase bridge elevation, and the relocation of the existing bus interchange to incorporate the addition of taxi ranks and kiss-and-ride spaces.

Hecdal was engaged by the developers after providing a comprehensive and thorough

tender. The company has a significant and successful history on major development infrastructure projects and it was this reputation that provided Laing O'Rourke with the certainty that Hecdal's scope of works would be undertaken with the utmost professionalism, care and safety.

Hecdal is a progressive company and it is clear from previous projects they have completed that their dedication to their staff is only matched by their ability to ensure stringent OH&S protocols are adhered to. The company provides extensive OH&S and careers training to its entire staff. A core belief is that skilled and safe employees produce exceptional work quality and exceptional work means satisfied clients.

Of the many things that can be imitated by others – a professional and dedicated workforce is the hardest to replicate. This aspect of Hecdal's operations provides the company with a significant advantage over their competitors. Additionally the company's

organisational, planning and management capability generates efficiencies and effective programmes of operation that ensure the most complex and challenging of projects are accommodated within time and budget guidelines.

Hecdal are very proud to have been involved with Laing O'Rourke and the CTI Project and the successful expedition of their works is sure to enhance an already sound reputation.

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AN ALARMING SUCCESS

With 115 years of experience in providing fire services and safety systems to a wide range of businesses, Wormald also has the added leverage of belonging to the Tyco group of companies. Tyco adds a further level of expertise and understanding with access to a global knowledge base from over 80 countries. These indisputable credentials provide Wormald with the ability to undertake a wide and varied brief of fire protection projects from conception through to completion.

The \$160 million Chatswood Transport Interchange (CTI) when completed will have the capacity to accommodate up to 100,000 commuters daily. A complex multi-use infrastructure facility such as the CTI incorporates a number of different areas over which fire services protection and facilities were required. These areas include the bus interchange, rail platforms, retail areas and car parks.

Wormald provided its services over three broad arenas – that of monitoring and detection including thermal and smoke detection alarms, fire suppression and control with a range of

sprinkler systems, hydrants and extinguishers, and emergency warning and communication combining public address with emergency warning and intercommunication. Within these areas Wormald also supplied project specific detail such as nine inert gas fire suppression systems for sensitive areas, fire fan control systems, and hearing impaired alert systems.

Mark Gowans, the General Manager of Wormald Australia was keen to highlight one of the challenges the CTI project presented, "One of the most interesting aspects we found with this development has been working with two power grids as opposed to just one." He explains, "Both RailCorp and Energy Australia provide power to the site. What this means for the installation is that we're conscious of always meeting the right regulations for whichever grid we are working on – an example of this is that any conduit pipes on the RailCorp side have to have chemical anchors to insulate them. So as well as being a large scale installation there is also a range of operational details to factor in."

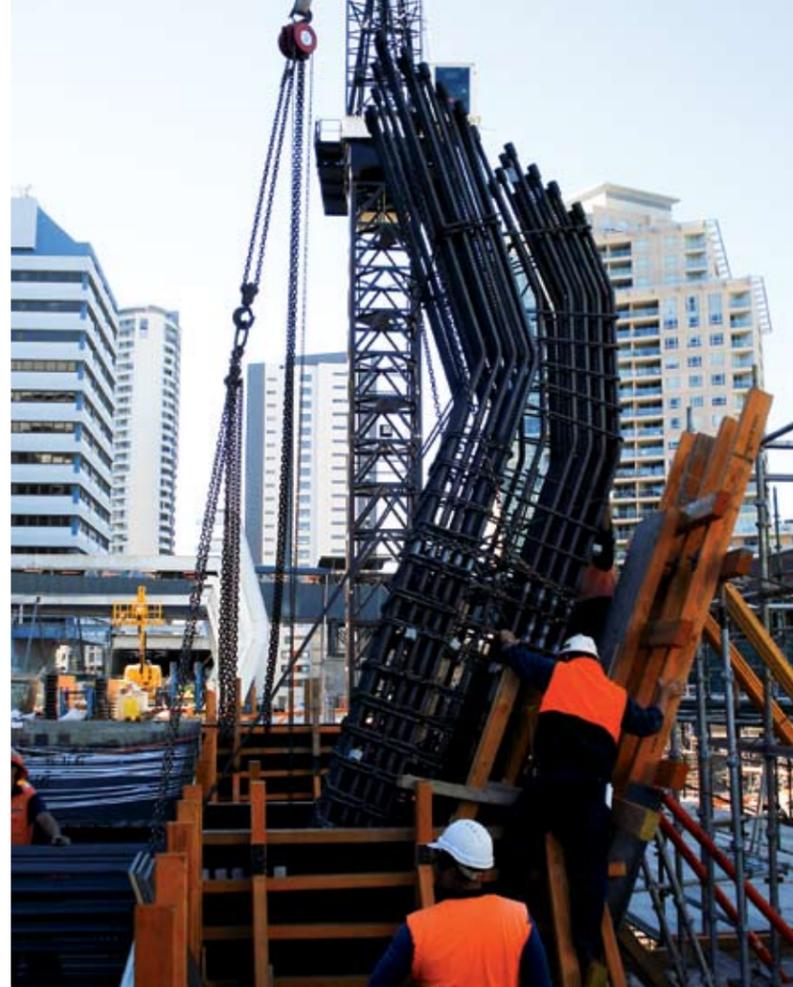
Additionally, while Wormald provided the installation, it was required to operate around the day to day running of the transport hub.

This required re-routing services through the two-stage construction process and working around temporary structures as opposed to isolating the required areas which would be the option on most projects.

Wormald has the capacity to assign a dedicated client team to every project – this not only ensures continuity and clear communication but also the delivery of the client's specific requirements integrating drafting, design, solution, construction and installation into one holistic result tailored to the clients budgetary and asset controls.

Wormald's core principles of client satisfaction, safe work practices, and a cost effective solution have been well demonstrated on the CTI project. Naturally the company is proud of what has been achieved through the careful and thorough delivery of its services.

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REINFORCING VALUES

The scope of the \$160 Million Chatswood Transport Interchange (CTI) Project is complex and diverse. The anticipated benefits that will flow through to the transport hub of Chatswood and the North Shore are also expected to be very significant.

The CTI project consists of the construction of redesigned pedestrian and rail concourses, improved pedestrian access to rail and bus, rail bridges over – and the widening of both Help Street and Albert Avenue and the relocation of the existing bus interchange. The CTI has been designed to accommodate an anticipated 100,000 commuters daily – integrating with the existing North Shore Rail Line and the new Epping to Chatswood Rail Link.

Resulting from a comprehensive tender Active Steel Pty Ltd was awarded the contract for the detail and manufacture of the steel reinforcement for the total project (approx 3000 tonnes). Of particular interest was the fabrication of 10 large ‘banana’ columns for the interchange. These columns were created using 40mm bar with couplers – the steel being bent to form the required curve or banana

shape. Each column weighed approximately five tonnes and was 3.7m high, 1.5m deep and 1.5m wide. Working with Laing O’Rourke, Active Steel designed a prefabricated jig that enabled the welding and bending to take place at their factory so that the complete unit could be delivered on site.

Active Steel is a privately owned Australian family business specialising in the manufacture, supply and delivery of steel reinforcing product. The company is one of the most technologically advanced operators within the industry. Significant investment in the very latest computer aided design and European manufacturing systems has given Active Steel the ability to produce to exacting tolerances with speed and efficiency. The company’s fleet of trucks and their relocation from Seven Hills to a larger two hectare premises in Penrith has also enhanced their operational efficiency. Active Steel is fully accredited by the Australian Certificate of Reinforcement Steel (ACRS) and manufactures to Australian standard AN/NZ4671.

The company’s involvement on the CTI

project is a good example of the operational methodologies of Active Steel – it reflects not only their experience and adaptability in providing the required product efficiently and within time and scheduling constraints, but also their capacity to communicate and coordinate with clients to establish the most effective solutions to the challenges presented.

Active Steel has the experience and quality personnel to be able to deliver on the most challenging projects. Combined with an open and innovative approach, rigorous OH&S protocols and training and advanced manufacturing facilities it is not surprising to see Active Steel involved in some of the largest projects currently underway in NSW – the Chatswood Transport Interchange being just one such example.

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A VERY SPECIAL COMPANY

The \$360 Million Chatswood Transport Interchange (CTI) Complex heralds a new era in design and architecture. The redevelopment of one of the busiest transport hubs in Sydney required extensive planning and coordination to ensure smooth passage from the plans to the site. One aspect of this delivery process was the requirement to assess the effects of the wind on the planned structure and the surrounding environment. Heggies was appointed by the developers to assist with this process and to model the possible results of wind action upon the completed development with the inclusion of additional towers planned for the future.

Heggies is a name that has become synonymous with quality specialist advice on a diverse range of areas within the building and construction industry. Operating for 30 years and with offices in most Australian states and in Asia, Heggies employs engineers and scientists from a wide variety of fields who have the experience and capability to provide the very best advice on complex issues.

In brief the CTI project delivered the construction of new pedestrian and rail concourses, lift and escalator access to rail platforms, bus interchange, rail bridges over Help Street and Albert Avenue, widening Help Street and Albert Avenue, lowering of Help Street to increase bridge elevation, and the relocation of existing bus interchange. The project has been designed to accommodate an anticipated 760 bus movements per day and through traffic of 100,000 commuters.

As the wind engineering consultant for all aspects of the project, Heggies undertook environmental wind tunnel testing of the CTI and surrounds using a scale model of the development. In addition, Heggies used Computational Fluid Dynamics (CFD) to determine interior wind flows within the concourse, tunnels and other internal retail spaces including the large Food Court area. This combined approach delivered data on possible areas of high wind activity that could be addressed and then re-tested. Finally, the CFD approach was extended by Heggies

to provide state-of-art predictions for wind-driven rain ingress for internal retail areas of the development. Heggies’ wind studies led to numerous design modifications aimed at ameliorating potentially adverse wind or wind-driven rain conditions.



HEGGIES

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